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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/797,335	03/10/2004	Hideki Iwata	60377-0019 (W1339-01)	4427

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RADER, FISHMAN & GRAUER . P.L.L.C  
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SUITE 501  
WASHINGTON, DC 20036-5339

EXAMINER
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LANG, AMY T

ART UNIT	PAPER NUMBER
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3731

MAIL DATE	DELIVERY MODE
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07/10/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/797,335

Applicant(s)

IWATA ET AL.

Examiner

Amy T. Lang

Art Unit

3731

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 16 April 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,3,5,7-9 and 11-16 is/are pending in the application.
- 4a) Of the above claim(s) 2,4,6 and 10 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3,5,7-9 and 11-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior office action.

### ***Response to Arguments***

Applicant's arguments filed 4/16/2007 have been fully considered but they are not persuasive.

1. Specifically, applicant argues (A) that Hermann does not disclose or suggest a copper-based alloy powder or aluminum-based alloy, superior in thermal conductivity, is mixed with a thermosetting resin to prevent heat accumulation in a sliding layer as in the present invention.

With respect to argument (A), as recited in the office action mailed 2/1/2007, Hermann discloses a composition comprising a copper-based alloy (claim 7, column 11) and an epoxy thermosetting resin (column 1, lines 12-14). Since the instant claim 1 only broadly discloses the copper-based alloy and Hermann also teaches a copper-based alloy, it is the examiner's position that the copper-based alloy of Hermann would also be superior in thermal conductivity.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

Art Unit: 3731

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hermann (US 3,839,209) in view of United Lab Equipment, Inc and Wikipedia.

Hermann discloses a sliding layer composition that provides anti-friction properties to a sliding element, which therefore overlaps the instantly claimed sliding member (column 1, lines 12-17). The composition comprises an epoxy resin, mixtures of bismuth powder and metal (lead) powder, and a solid lubricant (column 1, lines 12-14; column 3, lines 9-11; claim 1, column 11). The metal powder is further disclosed as an alloy comprising copper, which therefore overlaps a copper based alloy (claim 7, column 11). The solid lubricant is further disclosed as graphite, molybdenum disulfide, and lead sulfide (claim 8, column 11). Since the combined ingredients, including the bismuth powder, copper-based alloy, and resin are mixed together to form a sliding layer composition, the ingredients are therefore mixed in the sliding layer.

Hermann does not disclose the amounts of each component in vol%.

The mixture of bismuth powder and metal powder, as disclosed by Hermann, is present in the composition from about 5 to 60 wt% (claim 1, column 11). Since density

Art Unit: 3731

is a standard characteristic, the examiner utilizes a density of  $11.34 \text{ g/cm}^3$  for the lead powder and  $9.78 \text{ g/cm}^3$  for the bismuth powder (Wikipedia). Furthermore, the remainder of the composition is comprised of an epoxy resin in an amount from 40 to 95 wt% (claim 1, column 11). The density of an epoxy resin is estimated at  $1.96 \text{ g/cm}^3$  for the calculation (United Lab Equipment, Inc). Thus, the examiner computed the total volume of each extreme range of bismuth or metal powder and the epoxy resin by using the formula  $(\text{wt})=(\text{vol})(\text{density})$ . The vol% of bismuth and lead was then found by dividing the range of bismuth or metal with the total volume. The vol% of the lead is found to be between 0.91 and 20.58 vol% and the bismuth between 1.06% and 23.10%. Therefore, although Hermann does not specifically disclose the instantly claimed ranges, Hermann does disclose a mixture of the two in ranges that overlap the instantly claimed so that it would have been obvious to utilize each component within the instantly claimed amounts.

The amount of solid lubricant lead sulfide is utilized in one example in an amount of 7 wt% (Example 4, column). The other components and their density include Resin A ( $1.96 \text{ g/cm}^3$ ), Resin B ( $1.96 \text{ g/cm}^3$ ), powdered lead ( $11.34 \text{ g/cm}^3$ ), Sil Aid ( $2.33 \text{ g/cm}^3$  which is the density of silicon), and aluminum phosphate ( $2.566 \text{ g/cm}^3$ ) (Wikipedia and United Lab Equipment, Inc). As explained above, the volume of each component was calculated using the formula  $(\text{wt})=(\text{vol})(\text{density})$  and then the total volume was added. The vol% of lead sulfide was calculated as the vol of lead divided by the total volume, which was found equal to 2.3 vol%. Therefore, the amount of solid lubricant lead sulfide clearly overlaps the instant range of 1 to 30 vol%. Since Hermann discloses that either

Art Unit: 3731

lead sulfide, graphite, or molybdenum disulfide can be used in the invention as the solid lubricant, it would have been obvious to replace lead sulfide with graphite or molybdenum disulfide and utilize them in the same amount.

Since Hermann discloses the metal powder, bismuth powder, and solid lubricant within the instantly claimed ranges, the sum of these three components would not exceed 70 vol%.

5. Claims 9 and 11-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hermann (US 3,839,209) in view of United Lab Equipment, Inc, Wikipedia, and Shimotomai (US 5,868,555).

The combination of Hermann, United Lab Equipment, Inc and Wikipedia, as discussed in paragraph 4 and incorporated here by reference, disclose a composition that provides anti-friction properties to a sliding element. However, this combination fails to disclose the sliding member as used for a swash plate of a swash plate type piston pump.

Shimotomai discloses, as shown in Figure 5, a swash plate type piston pump (11b) (Column 4, line 66 through column 5, line 2). The swash plate comprises a sliding member (78) (column 5, lines 13-14).

Hermann discloses the disclosed composition as providing advantageous anti-friction properties to a sliding member and Shimotomai discloses that swash plates comprise sliding members. Therefore, it would have been obvious to one of ordinary

skill in the art at the time of the invention for the composition of Hermann to be utilized in a sliding member of a swash plate type piston pump for reduced friction properties.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Amy Lang whose telephone number is (571) 272-9057. The examiner can normally be reached on Monday - Friday, 8:30 a.m. - 5:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anhtuan Nguyen can be reached on (571) 272-4963. The fax phone

Art Unit: 3731

number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

6/26/2007

Amy T. Lang

AR

  
ANHTUAN T. NGUYEN  
SUPERVISORY PATENT EXAMINER  
6/30/07